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A SUMMARY OF CURRENT

FOREST PEST PROBLEMS FOR NEW YORK STATE

1962-63

(Fourth Summary Report of Detailed Report Submitted 1956-58)

Compiled by
The Committee on Insects and Diseases
Society of American Foresters
New York Section

January 31, 1963

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ANNUAL REPORT OF THE COMMITTEE ON INSECTS AND DISEASES (1962-1963)

Society of American Foresters, New York Section

The New York Section SAF Committee on Insects and Diseases submits the following annual report as a summary of the current tree pest problems for New York State covering the period of 1962 and in some cases, the projected possibilities for 1963. This year the Committee was fortunate in also having access to the tree pest sub-committee reports of the Natural Resources Committee - Cornell University - State University College of Forestry. Upon the suggestion of Chairman Larry Hamilton sections of the tree pest report are incorporated in this report.

Many of the problems currently the subject of research by various agencies are not new and specific details have been covered in previous reports since 1956. There has, however, been an increasing number of perplexing and complex pest problems developing in New York State as well as in adjacent states that are threatening plantations and other forest areas. These may cause changes in forest management plans in the future, especially since many of these may require long and intensive research studies before effective controls can be developed. During the past year (1962) additional facts and changes concerning major pest problems developed that should be brought to the attention of New York foresters and other cooperators at this time. It is of concern also for those who are in direct contact with other agencies and the general public who are also becoming increasingly aware of these problems.

IMPORTANT DISEASE PROBLEMS

Fomes annosus. Since the disease was first detected in a New York State plantation in 1948, it has caused increasing damage in coniferous plantations within the State. Present research is concentrated on attempts to control the disease by plantation management practices. Stump treatments with various chemicals are being tested by the Conservation Department and Cornell University. Experiments are in progress to explore possibilities of using inexpensive chemicals for protecting fresh stumps in plantations from invasion. Environmental factors affecting basidiospore production are being studied at Cornell University in attempts to reduce inoculum. A new infection center was found in Lewis County this year as well as one in St. Lawrence County near Canton, New York. The greatest damage from the disease so far has been in red pine plantations following thinnings.

Ash Dieback. Surveys made by the Bureau of Forest Pest Control and the State University College of Forestry during 1960 and 1961 reveal that thirty-one percent of the ash in the forests were diseased and six percent were dead; roadside trees showed that thirty-two percent were diseased and four percent were dead. In summary, the surveys showed that sixty-three percent of the white ash in the State are healthy and thirty-seven percent are in some stage of decline or dead.

The College of Forestry is conducting studies on the etiology of the disease and environmental factors associated with disease distribution and intensity. The State Science Service is studying the insects associated with diseased trees as possible vectors. Studies are also continuing on the rate of deterioration of diseased and dead ash. Preliminary results indicate that ashwood can be used safely for general purposes until the tree crown death occurs. Studies on the rate

of development of the disease in forest stands show that small saplings and poles may die within two years while larger trees may survive for ten years or longer. Research is continuing on etiology of the disease and the development of possible control measures.

White pine blister rust. A statewide control program on Ribes eradication has been conducted for many years by the Conservation Department in cooperation with the U. S. Forest Service. According to recent estimates, the present and potential commercial stumpage value of the white pine now growing within the established control areas amounts to approximately to $200,000,000. Pine acreage is constantly changing, and the Bureau of Forest Pest Control has the problem of eradication of Ribes in the new areas. To protect 699,612 acres of high value white pine, 1,948,157 acres of control land is involved.

The College of Forestry is continuing research on the nuclear function of pycniospores in the life cycle of Cronartium ribicola since the validity of long range tree breeding programs may hinge on the probability of strain formation in the pathogen. White pine selections are under test for resistance to the rust. Studies on the effectiveness of Acti-dione as a control for established blister rust cankers are in progress.

The Conservation Department is continuing tests with the antibiotic, Phytoactin (L318) applied to the foliage of pines using a truck mounted mist blower or by aircraft. Other formulations of Phytoactin, namely L439 and L440 are also being tested.

Beech Nectria and associated Cryptococcus fagi. About two-thirds of the beech growing area of the State is now infested with the beech scale and it has continued to spread to the North into the Adirondack area. The population of beech scale has continued on a high level in many beech stands in the Eastern part of the State and has been reported to be increasing in the Cortland and Oneonta areas. One new location was reported west of Poland, New York, on Route 28 in Herkimer County.

The beech nectria, which is part of this complex, is found frequently in the Catskill mountain areas. The beech scale-nectria complex has been responsible for the death of many beech trees and is generally becoming a serious problem. No effective field controls are known at the present time. Beech scale study plots have been under observation for more than ten years by the State Science Service.

Beech Decline. Beech is one of several tree species which is affected by a decline of unexplained cause, possibly environmental, which is adversely affecting this species throughout most of the State south of the Adirondacks and west to Lake Erie. Large areas of dead and dying beech may be readily observed in the Catskill mountain region.

As reported previously by the committee, affected trees are typified by chlorotic leaves, thin foliage and twig mortality with eventual death of branches and crown and finally the entire tree. There does not appear to be

any pattern as to where diseased trees are found and they have been reported in undisturbed stands, logged over areas, hedgerows and pastured woodlots. This problem is on the increase.

Sugar-Maple Decline. Like the previous problem, this malady has been observed in ever increasing numbers along roadsides, in hedgerows, and more recently in woods where they are isolated from most of the conditions that might affect an open grown or roadside tree. The causal agent has not been determined at this time and possibly it may be a combination of biological and environmental factors. A thorough study of the etiology of maple decline is being made by the College of Agriculture (Cornell).

Oak Mortality. Cornell previously initiated studies in affected areas and the cause of oak mortality now appears to be a complex of factors with insect defoliation and moisture stress being most important.

Red Pine Malady. The College of Agriculture at Cornell has conducted research on red pine diseases related to wet sites and selection of well-drained planting sites for red pine is now recommended.

Unidentified Cankers on White Pine. So far, no primary pathogenic agent has been isolated to explain this stem canker which closely resembles a blister rust canker. This disease is affecting large numbers of trees on approximately 4,000 acres on the Tug Hill Plateau in Lewis County. Research by the Northeastern Forest Experiment Station is continuing and field experiments have been established in several infected plantations on Tug Hill. It is hoped that the cause can be determined before white pine is eliminated as a primary plantation tree in the affected area.

Woodgate or Western Gall Rust, Peridermium harknessii. This disease has been present for many years on Scotch pine in the Adirondack region. The pathogens continuing spread is indicated by its presence on trees of various ages from twelve counties in the northern and central parts of the State. It is primarily a Christmas tree plantation problem due to its disfiguring affect on branches and stem.

Environmental Diseases. Besides the diebacks and declines previously mentioned some others on which research is needed are black cherry decline and balsam fir malady.

Wilt Diseases.

a. Dutch elm disease. Control by sanitation practices, spraying and root pruning are recommended. This disease is serious in many sections of the State and has become a major problem in many cities. Extensive research is being conducted principally by the College of Agriculture on vector control, studies on antibiotics for suppression of the Dutch elm disease fungus, and testing of resistance of elm trees. The College of Forestry has established plots for further testing of resistance of elm grafts and hybrid seedlings from resistant elms and continues studies on effectiveness of control programs in municipalities. In addition to research underway, further studies are necessary to develop

effective preventative control treatments for shade trees and better educational approaches to the public on sanitation of dying and dead elms.

Oak Wilt. No evidence was found of this disease in New York State up to the present time based on Conservation Department surveys.

Foliage Diseases.

White pine needle blight. Recent research by the Southeastern Forest Experiment Station of the U. S. Forest Service suggests that at least one form of the white pine needle blight is caused by small amounts of ozone and other air contaminants. Research on the selection and development of strains of white pine resistant to the disease is needed.

Heartrot.

The College of Forestry is continuing research with Fomes pini in white pine and other heartrot fungi in hardwoods to study rate of decay and related cull evidences as well as development of methods of field controls. The College of Agriculture is continuing studies on the establishment and early stages of decay in trees to develop better methods of pruning and pruning wound treatments. Research is needed on many other important heartrots to develop needed control practices applicable to extensive forest management practices.

Heartrots comprise the major tree disease losses and losses have been estimated at 13% of our standing timber volume.

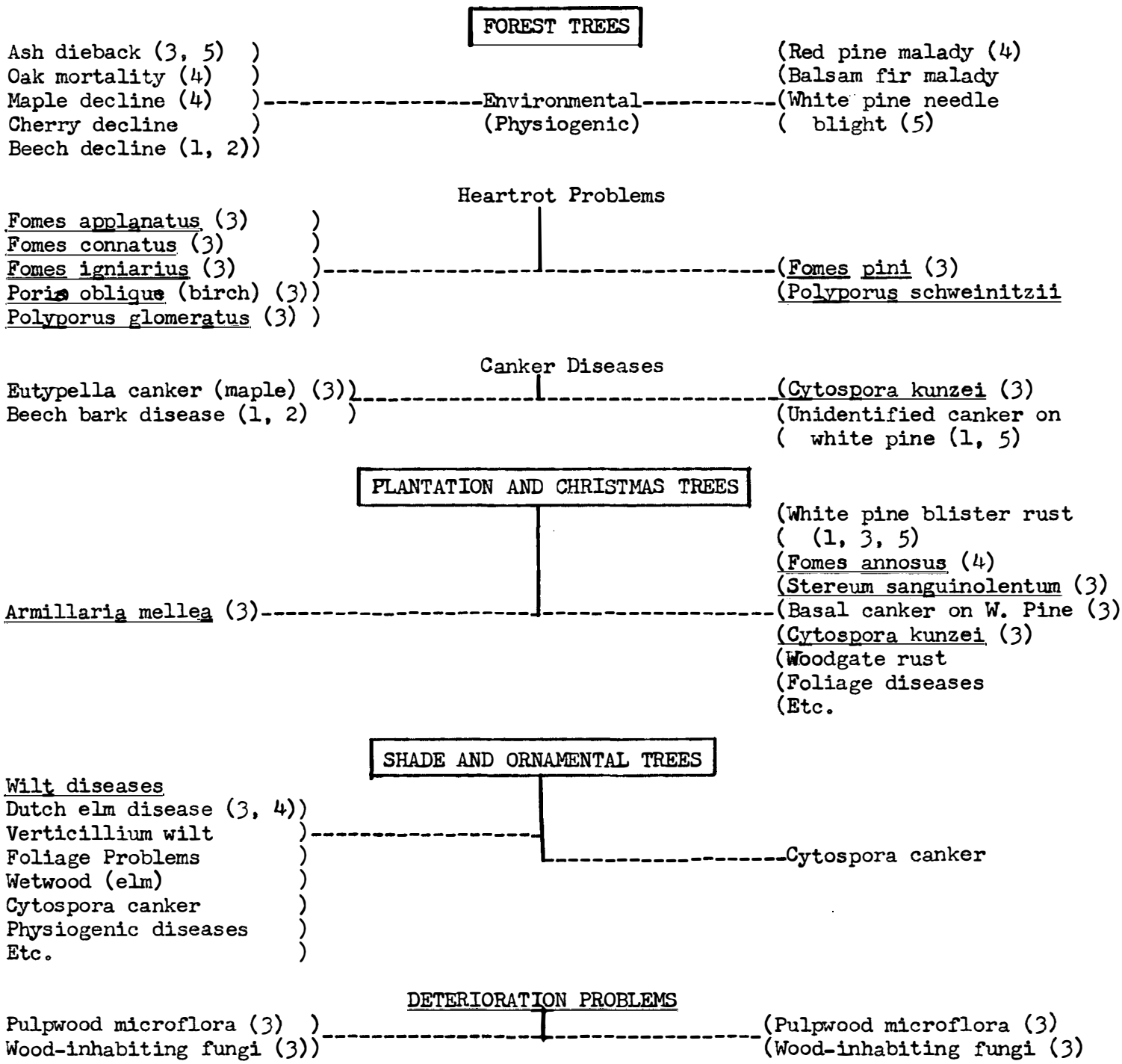
Wood Deterioration.

The College of Forestry is continuing its research on decays and stains which develop in wood during storage and use. Losses have been estimated at 10% of the annual timber cut. Control of these problems is a major need.

Studies are continuing on the wood-inhabiting fungi, wood preservative evaluations, wood durability determinations, chemical studies of wood decay, studies on types and sequences of fungi associated with ground line failures of wood, control of storage losses of pulpwood, and determination of microflora of pulp and paper.

A summary follows of these major disease problems for New York State. Additional research is needed, particularly with shade and ornamental trees on such diseases as Verticillium wilt, wetwood of elm, Cytospora canker, foliage problems and physiogenic diseases. There are effective fungicide sprays for many foliage problems, but effective controls for others are uncertain. These disease problems will also become of increasing importance to the general public with population shifts to suburban areas.

MAJOR DISEASE PROBLEMS WITH TREES



Research by

(1) State Conservation Dept.
(2) State Science Service
(3) State College of Forestry (Syracuse)
(4) State College of Agriculture (Cornell)
(5) U. S. Forest Service

MAJOR INSECT PROBLEMS

Gypsy moth, Porthetria dispar. Approximately 14,000,000 acres within the State are infested with this insect of which 5,500,000 acres can be subject to heavy infestations due to the forest type involved. The State sprays for control only areas of susceptible forest growth that are harboring high gypsy moth populations which if left untreated would result in severe defoliation.

In 1962, under direction of the Conservation Department, 146,000 acres were sprayed with six percent DDT oil solution for the control of the gypsy moth. Aerial sprays were applied in Albany, Clinton, Columbia, Dutchess, Essex, Fulton, Greene, Rensselaer, Saratoga, Schenectady, Scholarie, Ulster, Warren, and Washington Counties. Applications of spray to 103,250 acres were conducted by planes under state contract; the remainder was treated with the two State-owned planes. Three hundred acres were treated with Sevin at the rate of one pound of Sevin (actual) in one gallon per acre in Warren County. This was a cooperative experiment between the State Science Service and the Conservation Department in which Sevin was applied in water, with and without Lovo 192 sticker, as a pre-hatch spray. Results showed that the spray including Lovo gave satisfactory control of gypsy moth.

The Federal Agricultural Research Service treated an additional 26,870 acres in fifteen counties. Of this total, 25,760 were aerially sprayed with Sevin at the rate of one pound in one and one-half gallons per acre, and 1,110 acres were sprayed by ground equipment with DDT emulsion. The Agricultural Research Service also conducted a trapping survey in seventeen counties. Some 21,322 individual traps were placed in the field baited with "Gyplure", a synthetic gypsy moth sex attractant. This trapping program revealed catches in ten counties in which 187 moths were caught in 137 traps. The survey indicated no further westward spread of this pest over last year. The most westerly catch was made in the Township of Orleans in Jefferson County. The most northerly recoveries were made in Franklin and Jefferson Counties. The majority of the captures were made in Orange, Rockland, Sullivan and Westchester Counties.

The Bureau of Forest Pest Control 1962 preliminary fall scouting surveys show a continued increase in gypsy moth population in the infested area in the eastern section of the State, except for Clinton and Essex Counties where a decrease is apparent. Three important factors influencing the increase appear to be favorable weather, approach of the cyclic high for the pest, and reduced acreage sprayed due to hazards in insecticide use. It is estimated that approximately 160,000 acres of susceptible forest land will require treatment next year to prevent large scale defoliation.

A cooperative research project in aerial spraying was conducted with the Northeastern Forest Experiment Station of the United States Forest Service, Agricultural Research Service, the State Conservation Department Bureau of Forest Pest Control and the New York State Science Service. The materials tested were Bacillus thuringiensis (a bacterial material) and a polyhedral virus. Approximately 1,700 acres were treated with these materials singly or in combination. The results of this year's experiment have now been assessed. In brief, one treatment (4 lbs. Thuricide in 4 gals. of water per acre) gave satisfactory results. Lesser concentrations of this material in water formulation and all treatments with Thuricide in oil gave unsatisfactory or erratic results. Improvement in certain technical characteristics of the presently available commercial preparations of Bt will reduce problems in handling and application and at the

same time may increase biological potency. In most of the treated plots, defoliation by the gypsy moth was reduced significantly, even though the overall control effect in terms of population reduction was not considered satisfactory. Very high kill of the linden looper and cankerworms was observed in the treated areas. Plans are under development to continue this field research project.

The Science Service, Conservation Department and U. S. Forest Service are continuing research on population dynamics and biology. The work includes studies of parasite interactions, the role of disease and desiccation, sex ratios, and other physiological and ecological considerations.

Shoot and tip moths.

A locally abundant infestation of Eucosma gloriola on Scotch pine was found in Allegeny County in a Christmas tree plantation. Previous similar damage reported in western New York had not been diagnosed due to lack of specimen material. Studies will be made by the College of Agriculture of the occurrence, species, biology, and control of bud, shoot, and tip moths of conifers.

Spruce Budworm, Choristoneura fumiferana. This year's examination by the Bureau of Forest Pest Control of the fifty permanent budworm plots in Essex, Franklin, Hamilton, and St. Lawrence Counties revealed no evidence of the spruce budworm's presence. It has remained at a very low level since the 1954 outbreak.

White Pine Weevil, Pissodes strobi. The cooperative program was continued this year between the Conservation Department and the U. S. Forest Service under the Forest Pest Control Act to control the White pine weevil. These agencies and the State Science Service are conducting research to develop standards and guides to determine the need and desirability of control. In addition, research is continuing on the ecology of the weevil, the relation of soils and sites to weevil attack and the use of portable and truck-mounted mistblowers for control of the weevil in forest plantations.

The fall mistblower treatments of 1961 showed good results on several areas and work is continuing on this and other types of treatments.

Other Weevils Attacking Conifers.

Injury to laterals of Scotch pine and locally to Douglas fir was light to moderate but extensive in western New York Christmas tree plantations. Rearings from neighboring stumps produced large numbers of Pissodes approximatus and some Hylobius pales. In a preliminary test by the College of Agriculture, several fall insecticidal treatments were applied to fresh cut stumps and will be duplicated by spring applications.

Sawflies Attacking Conifers.

Red-headed pine sawfly, Neodiprion lecontei. This sawfly is one of the most serious of the insects attacking young hard pines in the State. Various degrees of infestation were found on red and Scotch pine plantations in Fulton, Franklin, Lewis, Jefferson, Oneida, Oswego and Saratoga Counties. Control measures were employed on ninety-two acres of State reforestation land in Lewis County using a 4% DDT solution to combat this pest. The Forest Service Laboratory obtained

a small quantity of a virulent strain of virus which is highly effective against this pest and are now attempting to propagate it in order to obtain a larger supply for field use in 1963.

European pine sawfly, Neodiprion sertifer. Light to heavy attacks by this European introduction were found in plantations of red and Scotch pine in Fulton, Herkimer, Otsego, Orange and Westchester Counties. From field reports it appears that this sawfly is on the decline this year. However, the Forest Service Laboratory has a relatively large stock of virus available for practical control in the field.

Larch sawfly, Pristiphora erichsonii. There appears to have been a general decline in this insect's population since last year. It was present in plantations mainly in Franklin, Lewis, Rensselaer, Warren, and Washington Counties. A fifty acre larch plantation in Reforestation Area Lewis-Jefferson 1 was heavily defoliated.

Yellow-headed spruce sawfly, Pikonema alaskensis. This destructive sawfly of spruce was prevalent in St. Lawrence County. A young white spruce plantation in a State reforestation area in this county required spraying. A total of 25 acres was treated with a Knapsack mistblower using twelve percent DDT. Good control was achieved.

In summary for sawflies, no research has been reported but it is planned by the Conservation Department and the U. S. Forest Service to study control of sawflies by virus sprays as the opportunity arises.

Sawflies Attacking Hardwoods.

Birch leaf miner, Fenusa pusilla. This pest still continues to threaten gray birch and many trees of ornamental value have either been heavily damaged or killed. Cooperative research by the State Science Service with the Conservation Department in 1962 shows that a 2% spray of Sevin 4 Flowable applied by truck mounted mistblower biweekly from May 15 through July 1 gave excellent control. Cygon (Dimethoate) 4E applied as a 0.3% spray gave fair to poor control.

Red pine scale, Matsucoccus resinosae. The 1962 red pine scale survey showed that the infestation by this insect has extended about two miles north of the limits of the 1961 infestation boundary. The new area is just south of Thornwood on the Sawmill River Parkway, in Westchester County.

No spread was found to have occurred on Long Island in 1962 and no evidence of the insect was found in Rockland County where it adjoins the New Jersey infested area.

Pine needle scale, Phenacaspis pinifoliae. Very abundant populations of pine needle scale accompanied by severe damage to a park-type planting of Scotch pine were very effectively controlled with a 70 second dormant oil - 2% ethion combination (applied at the rate of 2 gallons/100 gallons of water). This was a large-scale field test observed by the College of Agriculture.

Periodical Cicada, Magicicada septendecim. This insect which is commonly known as the "17-year locust", is of special interest due to its unusual life-cycle. It appears only once every 17 years in the North.

Cicadas were very abundant in Columbia, Greene, and Dutchess Counties this summer and were found generally throughout the Hudson River Valley. They were also numerous in Rockland County but did not occur across the Hudson River in Westchester County. They appeared locally in quite large numbers but usually did not infest a very large acreage.

Hardwood defoliation. The State suffered considerable hardwood defoliation this spring by "inchworms" or "loopers". An extensive survey was conducted by the Conservation Department to determine the species involved. The two main insects concerned were the Linden looper and the spring cankerworm. Other defoliators encountered were the green fruitworm, fall cankerworm, oak leaf roller, oak blotch leaf skeletonizer, and a few miscellaneous Geometridae. The majority of the heavy defoliation was centered in Southeastern New York on oaks and Northeastern New York on beech. These insects are cyclic and high populations can last from two to eight years. No accurate prediction can be made about the situation for next year as the critical period occurs in the spring when adverse conditions could kill most of the population. In October, a heavy flight of male moths of both the fall cankerworm and linden looper occurred in certain locations of New York State about two weeks earlier than in 1961.

Mosquito and Biting Fly Control. In general, mosquito and black fly populations were somewhat lower in most areas this year, primarily due to the dry weather. In most sections of the Adirondacks, punkies were also far less abundant this year than in the previous years.

The State campsties, State nurseries, Saratoga Reservation, and the Wynantskill School grounds were sprayed by aircraft or mistblower in an effort to control these undesirable insects. A total of 4,489 acres were treated in this program. Many of the campsites and the Saratoga Reservation were sprayed twice for more effective control, bringing the total acres sprayed, in different applications to the same areas, up to 7,459.

Wood Deterioration. The College of Forestry is continuing research on the biology and ecology of insects causing the deterioration of wood. This includes wood borers, powder post beetles, ambrosia beetles, bark beetles, carpenter ants, termites and etc. In addition, the physiological effects of the attacks of wood borers upon host trees is also the subject of research as well as the effects of biologically active substances on the physiology of wood-inhabiting insects.

Soil Faunal Investigations. Research is continuing at the State University College of Forestry on various aspects of forest soil fauna, their biology, ecology, physiology, metabolism, and their responses to pesticides.

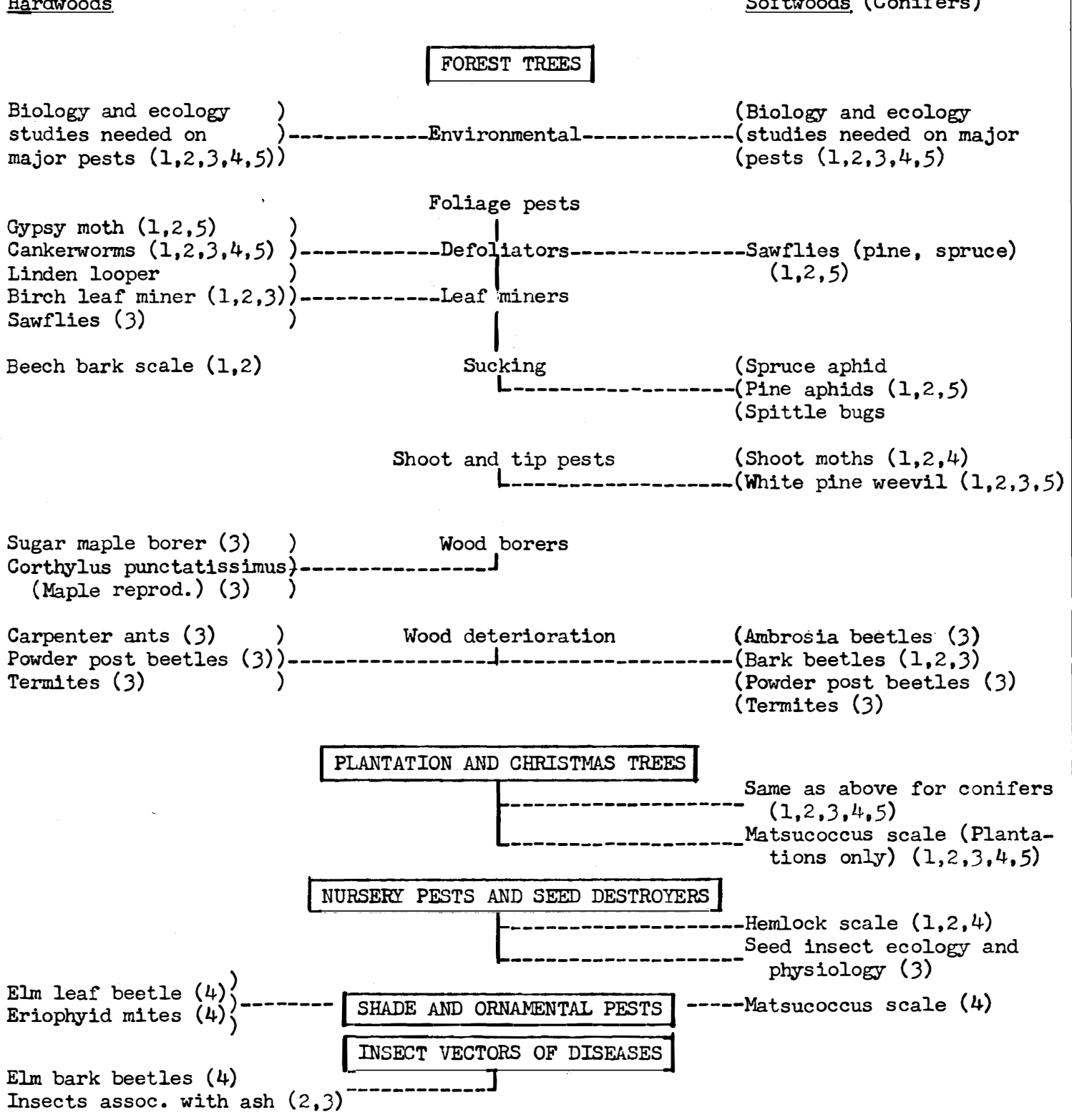
Long Range Effect of Pesticides. Although many forest insects may be controllable by insecticide sprays, spraying is not necessarily the best approach

for a specific problem. In general, research emphasis should be on the development of alternative means of control as well as continuing studies of new chemicals, formulations, and application methods.

For instance, the Northeastern Forest Experiment Station has current research projects on these problems and others more or less basic to the development of biotic methods of controlling destructive pests. At present, there is a need for increased research effort in developing alternatives to DDT and similar chemicals for controlling forest insects and minimizing damage by them on a long-term basis. Biotic control agents -- such as the specific insect viruses, Bacillus thuringiensis, and the sterile-male release technique -- can be both biologically and economically more efficient than chemical control methods. And such agents may be used to prevent outbreaks, along with cultural measures, as well as to suppress infestations that have reached noticeably damaging levels.

Summary of Major Forest Insect Problems. See chart next page.

MAJOR INSECT PEST PROBLEMS ON TREES



Research by

(1) State Conservation Dept.
(2) State Science Service
(3) State College of Forestry (Syracuse)
(4) State College of Agriculture (Cornell)
(5) U. S. Forest Service

Our Committee feels that the report of the tree pest sub-committee of the Cornell University - State University College of Forestry Natural Resources Committee has very well also summarized the major tree pest research needs in New York State so it is hereby printed verbatim to further emphasize this important field. It may be noted in passing that as brought out above, most of the topics listed as needing research are already being investigated by one or more agencies. The fact that they are listed here as "research needs" attest to their continuing importance.

"MAJOR TREE PEST NEEDS
IN NEW YORK STATE"

"It is difficult to list these problems in a dependable priority system without supporting survey data and an economic analysis. An apparently minor problem may rapidly develop into a major one. We believe that all problems listed are important and require attention and their numerical order does not indicate our views on their relative importance.

1. The development of systematic statewide survey procedures to yield quantitative data on disease and insect losses and detect the occurrence of new disease problems. It is often difficult to justify needed research programs until losses are established.

2. The establishment of an information collection and coordination center for fungicides and insecticides. Information to be collected would involve types of toxicants, formulations and methods of application, toxicological data, and testing research in progress.

3. Research on application problems involving pesticides.

4. Basic research on biological controls such as bacterial and virus diseases, parasites and predators.

5. Basic studies on pesticide toxicology, including modes of action and the metabolic fate of biologically active substances.

6. Basic studies on root diseases including Fomes annosus.

7. Basic research on environmental tree diseases.

8. Determination of the cause, environmental factors affecting and controls for ash dieback and maple decline.

9. White pine weevil - frequently in relation to site, spread, effects of climate, and population pressures.

10. Gypsy moth - factors affecting popualation buildup, virus and bacterial controls, chemical and genetical sterilization, factors affecting local and long-range spread, biological controls, factors affecting egg survival over winter, etc.

11. Development of a blister rust hazard classification.

12. Beech-bark disease - fungous sequences in bark invasion, factors affecting spread, insect-pathogen relationships, resistance mechanisms in trees.

13. Basic forest soil studies - litter decay sequences, pesticide decomposition, tree soil requirements as they relate to disease, fertilizers in relation to disease.

14. Population dynamics of insects and plant pathogens.

15. Biological and control studies on the red scale.

16. Studies on nursery, Christmas, and plantation diseases.

17. Studies on the Dutch elm disease and its control.

18. Wood deterioration studies - fungi and insects.

19. Economic studies of various diseases and pesticide control possibilities.

20. Ecology and control of tree seed insects.

21. Physiological studies on insect behavior."

Tree Pest Sub-committee of the Cornell University - State University College of Forestry Natural Resources Committee

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Respectfully submitted by The Committee on Insects and Diseases, Society of American Foresters, New York Section.

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ARTICLES ON INSECTS AND DISEASES AND RELATED FIELDS
OF INTEREST TO FORESTERS
PUBLISHED DURING PERIOD 1962-63
BY STATE AND COOPERATING FEDERAL PERSONNEL

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